Usability Testing of Android Applications

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Nowadays the quality of a company is determined mainly by the quality of the software it uses, thus it has become more important to obtain high quality software. Therefore quality assurance plays a central role in the software industry.

In addition, if we observe the importance of the certification steps in Microsoft's Windows Store application publishing process [1], or we notice the fact that because of various quality concerns Google has permanently restricted the downloading of about a hundred and fifty thousand apps which were available in the official Android Play Store in mid-2013, then we can see that quality assurance is not only essential for the desktop applications, but it is more and more crucial in the constantly growing segment of the portable devices.

Software quality is a complex attribute. It has many aspects so numerous qualitative and quantitative characteristics should be taken into consideration during its calculation. Landauer [2] states that a significant part of software bugs are related to some kind of usability problems, so we can suppose that measuring applications from a usability point of view will give us an insight into the overall quality of the actual software.

In general there are several solutions which help to create qualitative applications and to qualify our existing applications, but in case of Android the situation is far from being optimal. Although there are some automatized tools that can help to determine the goodness of Android applications, there are hardly any software that can provide a comprehensive assessment regarding the usability of an application.

In this paper we would like to present a method that can help to solve the problem described above. We created a framework that helps to analyse the usability of android applications.

To assess usability we had to be able to log the relevant interactions of the users on the graphical user interface, thus, we developed a tool which injects logging methods into the applications by instrumenting them, but without modifying the original functionality of the programs. For example, it partially modifies the inheritance tree and the event handling mechanism, as also it replaces some of the UI descriptions, but preserves the original behaviour.

We applied this tool on a few Android apps and for each of them we defined use case scenarios that respects the features of the actually tested application. After we executed these use cases we got several log files that served as a base for the further investigations. We analysed these logs and based on our observations and the experiences of our usability experts we defined metrics (e.g., navigation anomaly, misclick, etc.) and a model that can provide sophisticated information about usability.

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References

[1] Microsoft Inc. Overview of publishing an app to the windows store, May 2014.

[2] Thomas K. Landauer. *The Trouble With Computers: Usefulness, Usability, and Productivity*. MIT Press, Cambridge, Massachusetts, 1995.